

he will consent to remain. Nevertheless marked advance has been made in certain directions. Apart from the employment of all the modern military and naval inventions, native-armed steamships have become common enough; the telegraphs are rapidly extending all over the country, and only last week a telegraph office was opened at Peking itself. Railways are to be introduced gradually, and the correspondent narrates the story of an attempt to work coal-mines on Western methods. The Kaiping mines, which are specially referred to, have not been altogether a financial success, on account of the difficulties of transport, the necessity of constructing a rough canal for part of the way, and the refusal of the authorities to permit of the regular employment of steam locomotives between the mines and the nearest waterway. Still the experiment is stated to be full of hope, for the causes which have rendered it a loss to its promoters can be remedied, it is said, by a stroke of the pen.

A RECENT number of the *China Review* contains an article on the Chinese and Japanese plants found in Normandy. During a recent holiday in Europe the writer, M. Fauvel, was struck by the quantity of exotic and even sub-tropical plants cultivated there, and amused himself by searching for the Chinese and Japanese species. The district examined was chiefly that round Cherbourg. The paper describes first the trees and shrubs, which are in a majority, and then refers to the herbaceous flowers and plants, ornamental and useful. Among these were the *Camellia japonica*, the *Chamærops excelsa*, or Chinese palm, the deciduous magnolias of China, *Paulownia imperialis*, wistaria, the rhododendrons and azaleas of China and Japan, the Japanese quince (*Cydonia japonica*), and many others, all of which will be found noted in a paper which may be read with interest by many who take but a limited interest in botany.

DR. CHARLES CLAY contributes to the *Chemical News* of August 8 an interesting reminiscence of Dalton. Dr. Clay was a pupil of Dalton's, and he tells very graphically his adventures in search of four bottles of fire-damp, for which he had to proceed from Manchester to Oldham.

A GROTTTO, from 8 to 10 metres high, has been discovered in a rock, washed by the sea, in the Morbihan, by M. Gaillard. He has since continued his researches, at low water, and found some human bones, ancient earthenware marked with allegorical figures, and coins believed to have been struck by the early Gauls.

THE National Electrical Commission, *Science* states, met in Philadelphia on August 7. It was decided that the Conference to be conducted by the Commission will be called for Monday, September 8, to be then continued from day to day, as may be found necessary. The invitations to the Conference will be confined to physicists of eminence, and to experts in the practical management of electrical appliances and apparatus. It is proposed to extend special invitations to prominent foreign visiting electricians. It was also decided to issue a circular inviting the conferees to submit a paper to be read before the Conference. It is not definitely known what subjects will be discussed at the Conference, but the following matters have been suggested: the sources of electrical energy; the theoretical conditions necessary to the most efficient construction of the dynamo-electric machine for the various purposes of practical work; the electrical transmission of energy; the systems of arc and incandescent lighting; the theory of the electric arc, storage batteries, electro-metallurgy; lighthouses for the coast; applications of electricity to military and mining engineering; lightning protection; induction in telephone lines, and the problem of long-distance telephoning; the question of underground wires; atmospheric electricity; earth-currents and terrestrial magnetism; photometry and standards for photometric measurements; the ratio of the electro-magnetic to the electro-static system of units, and the

electro-magnetic theory of light; and finally, on account of the pressing necessity for accurate and uniform electrical measurements, it is probable that the question of establishing a National Bureau of Physical Standards will receive proper attention.

THE additions to the Zoological Society's Gardens during the past week include a Gelada Baboon (*Theropithecus gelada* ♀) from the Province of Amara, Abyssinia, presented by H. E. Lidge, Mercha Workee, Abyssinian Envoy; a Red-crested Cardinal (*Parus cucullata*) from South America, presented by Mr. John W. Miers; an African Elephant (*Elephas africanus* ♂) from Abyssinia, deposited by Her Majesty the Queen; two Cape Hunting Dogs (*Lycan pictus*) from South Africa, two Picui Doves (*Columbula picui*) from South America, deposited; a Common Cormorant (*Phalacrocorax carbo*), British, received in exchange.

### OUR ASTRONOMICAL COLUMN

COMET 1884 b (BARNARD, JULY 16).—Herr Stechert of Kiel has ascertained that the apparent deviation of the orbit of this comet from a parabola, mentioned last week, is due to error in the telegraphed position on the night of discovery, and that observations between July 23 and August 10, at Algiers and Rome, are well represented by the following parabolic elements:—

Perihelion passage, 1884 August 18<sup>h</sup> 18<sup>m</sup> 26<sup>s</sup> G.M.T.

Longitude of perihelion	... ..	303° 31' 27"	M.Eq.
" ascending node	... ..	357° 40' 19"	1884.0
Inclination	... ..	6° 52' 12"	
Log. perihelion distance	... ..	0.140670	
Motion—direct.			

Small inclination and direct motion have long been considered to favour periodicity, though we now have some striking exceptions. In the above orbit the comet, in approaching the sun, passes very near to the orbit of the planet Jupiter; thus, at a true anomaly of 240° 30', corresponding to heliocentric longitude 184°, the distance of the two orbits is less than 0.2 of the earth's mean distance from the sun, and the comet is, at this point of its track, 454 days before perihelion passage, or on the last occasion in May 1883, when the planet was far distant.

The following positions for midnight at Berlin have been calculated by Herr Stechert:—

		R.A.		N.P.D.		Log. distance from Earth
		h.	m.			
Sept. 15	... ..	19	21.4	... ..	119° 23'	9.8470
16	... ..	—	25.4	... ..	119 3	
17	... ..	—	29.3	... ..	118 43	9.8548
18	... ..	—	33.2	... ..	118 22	
19	... ..	—	37.1	... ..	118 1	9.8629
20	... ..	—	40.9	... ..	117 40	
21	... ..	—	44.7	... ..	117 19	9.8713
22	... ..	—	48.5	... ..	116 57	
23	... ..	19	52.2	... ..	116 35	9.8801

The above elements also give these positions:—

12h. G.M.T.		R.A.		N.P.D.		Distance from Earth.	Sun.
		h.	m.				
Oct. 20	... ..	21	18.7	... ..	105° 55'	1.041	1.656
Nov. 19	... ..	22	29.9	... ..	97 55	1.504	1.912

The intensity of light on October 20 is 0.34, that on November 19, 0.12, its value at discovery on July 16 being 1.16.

M. Perrotin has made the following observation:—

M.T. Nice				R.A.				N.P.D.			
h. m. s.				h. m. s.							
August 15,	8	48	54	...	17	13	6.79	...	126	28	28.4

He remarks: "La comète a l'aspect d'une nébulosité assez mal définie de 1' 30" de diamètre environ, présentant des granulations brillantes vers le centre."

KEPLER'S NOVA OF 1604.—Those who have taken interest in the actual configuration of stars near the place of the famous *Stella nova in pede Serpentarii* will be aware that Chacornac has a star of the tenth magnitude (or perhaps of the ninth, the symbol being a little ambiguous) in a position near that of the

star of 1604, where none has been since observed. It was of course desirable to clear up this difficulty, and Mr. Herbert Sadler appears to have done so effectually. He has remarked that in the part of the Chart No. 52, where the place of Kepler's star falls, the positions of a number of the brighter stars are incorrectly laid down for the professed epoch of the Chart, 1855 January 1, their right ascensions being uniformly in defect of the true ones; and he notes that, when the assigned place of Chacornac's star is corrected in right ascension to about the amount that several known stars in the vicinity require, it falls into the place of No. 16872 of Oeltzen's Argelander, so that, in Mr. Sadler's view, the stars are identical, and there can be no reasonable doubt that he is correct. It is very satisfactory to have eliminated the difficulty with regard to Chacornac's star, particularly as the place of Kepler's star can hardly be said to be comparable in accuracy with that of Tycho's star of 1572.

The following are places of three of Argelander's stars for 1855.0, on comparing which with the positions assigned on Chacornac's Chart No. 52, its distortion will be evident:—

	h.	m.	s.				
Oeltzen 16848 ...	R.A.	17	21	19.6	...	N.P.D.	112 49 47
„ 16816 ...	„	17	19	37.4	...	„	110 50 13
„ 16782 ...	„	17	18	3.3	...	„	111 16 54

THE YALE COLLEGE OBSERVATORY, U.S.—The fine heliometer of this Observatory is now in active charge of Dr. W. L. Elkin, who had given special study to the theory of this instrument at Strasburg, and subsequently had two years' valuable experience in the use of it, in conjunction with Dr. Gill, H.M. Astronomer at the Cape of Good Hope. From the Report to the Board of Managers in June last, it appears that the expenses attending the use of the heliometer have been guaranteed for a period of three years by ten subscribers; and Dr. Elkin, who took charge of it on January 15, is already able to report upon work accomplished, though time is necessarily occupied in the general investigations of the instrument, as scale determinations, &c. A triangulation of the Pleiades has been commenced, with the view to comparison with Bessel's measures of this group, made with the Königsberg heliometer nearly half a century ago, as well as with the later observations of M. Wolf at the Observatory of Paris; about one-third of the proposed measures had been completed before the stars were lost in the sun's rays in the spring, and it is hoped to complete the work during the last four months of the present year. A considerable amount of time has been devoted to determination of places of the moon relative to stars within measuring-distance of the heliometer, with the view to determining the parallactic inequality in the moon's motion, the deduction of which from meridian and other observations is, as Dr. Elkin remarks, attended with some difficulty. Measures of the diameter of Venus near her inferior conjunction have also been secured. There cannot be a doubt that, in Dr. Elkin's hands, most valuable results will accrue from the regular employment of the powerful measuring-instrument of Yale College Observatory. On the Board of Managers of the Institution we remark the well-known names of Profs. Elias Loomis and H. A. Newton.

## SOCIETIES AND ACADEMIES

### PARIS

Academy of Sciences, August 18.—M. Rolland, President, in the chair.—Obituary discourses pronounced at the obsequies of M. Paul Thenard, by MM. Bouley and Fremy.—Observations of the small planets made with the great meridian instrument of the Paris Observatory during the second quarter of the present year, by M. Mouchez.—Essays in stellar photography, with a view to the construction of maps of the heavenly bodies, by MM. Paul and Prosper Henry, by M. Mouchez. The results so far obtained have been secured by means of an objective with a diameter of 0.16 m. and 2.10 m. focal distance. They represent on a surface of rather less than a square decimetre a section of the Milky Way of 3° of right ascension, and 2° declination, showing 1500 stars from the sixth to the twelfth magnitude. The images of these stars have a diameter nearly proportioned to their brilliancy, except the yellow stars, which appear somewhat fainter. These encouraging results have induced MM. Henry, who are skilful opticians as well as experienced observers, to undertake the construction of a much larger objective with a diameter of 0.34 m., specially adapted for photographing the celestial orbs.—Note on a new method of representing graphi-

cally the speed of railway trains, by M. Léon Lalanne.—Report on various communications relating to the cholera, by the Commissioners, MM. Vulpian, Marey, Richet, Bert, Pasteur, Bouley, and Gosselin. Thirty fresh communications received by the Academy during the month of August have been examined with practically no results. Even Dr. Peyrussou's views regarding the efficacy of borax and boric acid are purely theoretic, unsupported by any practical tests.—Account of a new balloon capable of being guided in any direction and kept under control, by MM. Ch. Renard and A. Krebs. The authors claim to have solved the problem of aerial navigation by means of a new balloon of elongated form, and provided with a screw and helm, which was successfully tried at Chalais on August 9. After a trip of nearly five miles, it returned to the starting point, obeying the helm, and executing a series of manœuvres with a precision comparable to that of a screw steamship in the water. Chief dimensions: length 50.42 m., diameter 8.40 m., volume 1864 m., total weight 2000 kilos.—Observations of the Barnard comet made at the Observatory of Nice, by M. Perrotin.—Observations on the solar spots and volcanic eruptions during the year 1883, by M. P. Tacchini.—Note on a fixed astronomical telescope, by M. G. Hermite.—Note on the freezing-point of saline solutions, by M. F. M. Raoult.—On the combinations of telluric acid with the salts of the bioxide of tellurium, by M. D. Klein.—Researches on the modifications produced in the nutrition of the nervous system by mania, lypemania, and epilepsy, by M. A. Mairet.—Researches on the microbe of typhoid fever in man; its cultivation, and inoculation of the virus in rabbits, guinea-pigs, poultry, pigeons, pigs, and other animals, by M. Tayon.—Note on the slow period of latent excitation in the muscles of invertebrate animals, by M. H. de Varigny.—Account of a new variety of Rhizopod found on the Arcachon coast, south of Bordeaux, by M. J. Küstler.—Note on a relation between the temperatures of fusion of simple bodies and their atomic weights, by M. Chapel. The same author presented a paper on the coincidence of seismic and meteorological phenomena with the return of the August meteoric showers.

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